SUPPORT FOR THE AMENDMENTS

Claims 20, 21, 27 and 28 have been amended to address the objections set forth in the Office Action. Accordingly, no new matter is believed to have been added to the present application by the amendments submitted above.

REMARKS

Claims 17-28 are pending. Favorable reconsideration is respectfully requested.

As set forth in Claim 17, the present invention relates to a process for producing a purified resist polymer solution, comprising:

(1) dissolving a solid product comprising a resist polymer comprising a repeating unit decomposable by, and becoming alkali-soluble by, the action of an acid and a polar group-containing repeating unit, in a solvent (b) comprising one or more solvents selected from the group consisting of acetone, methyl ethyl ketone, tetrahydrofuran, ethylene glycol dimethyl ether, and ethyl acetate, and

(2) evaporating from the solution obtained in (1) the solvent (b) while adding, under reduced pressure with the temperature being controlled at 70°C or less, a solvent (a) comprising one or more solvents selected from the group consisting of propylene glycol monomethyl ether acetate, ethyl lactate, cyclohexanone, methyl amyl ketone, diethylene glycol dimethyl ether, diethylene glycol monoethyl ether, and γ-butyrolactone,

where the boiling point of solvent (b) is not higher than the boiling point of solvent (a) at atmospheric pressure, and

where the amount of impurities having a boiling point at atmospheric pressure of not more than the boiling point of the solvent (a) is 1 mass% or less of the resist polymer in the purified resist polymer solution.

An important feature of the claimed process is the solvent exchange in which solvent (b) is evaporated and replaced with solvent (a) as specified in Claim 17.

The rejection of the claims under 35 U.S.C. §103(a) over Miyaji in view of Zampini is respectfully traversed. These references fail to suggest the claimed process for producing a purified resist polymer solution.

Miyaji discloses a process in which a resin may be purified by removal of impurities such as halogens and metals by a liquid-liquid process. As recognized by the Examiner, this reference fails to teach the steps of such a process.

Thus, Miyaji teaches purification of resin by *liquid-liquid extraction process* in order to remove impurities such as halogens or metals but there is no disclosure or suggestion of specific steps of such liquid-liquid process. The present invention uses a solvent exchange process in which desired resist solvent is solvent-exchanged while removing a solvent having low boiling point. It is common knowledge to those skilled in the art that liquid-liquid process and solvent exchange process are totally different techniques.

Zampini discloses a phenolic resin purification process. As recognized by the Examiner, this reference also fails to disclose the claimed process.

Zampini uses novolac resin of cresol and salicylaldehyde, whereas in the present invention, a CAR polymer of an acrylic monomer is used. The solvent used by Zamipini to polymerize cresol and salicylaldehyde is an acidic soluble solvent, which of course has different properties from MEK and the like used as solvent (b) of the present invention.

Zampini teaches, as a desirable method of removing unwanted solvent, diluting the solution with photoresist solvent and then vacuum distilling. However, applicability of such method to the present application is not possible because the polymers used, namely their structures, are different between the two inventions. Moreover, the specific steps of the method is not given in the Examples.

Further, Zampini does not mention conducting the removing step under reduced pressure of 70°C or lower. As recited in Claim 17 of the present application, the removing step is conducted under reduced pressure of 70°C or lower, which is one of the features of the present invention. The Examiner's assertion is that the temperature of 70°C or lower is met in Example 18 of Zampini is inappropriate. This is because in Embodiment 18 of Zampini, the solvent to be removed is methyl-t-butylether which has an extremely low boiling point of 55°C. However, the solvent (b) to be removed in the present invention examples of which are given in Claim 17, is higher than this boiling point.

Both references fail to teach the solvent exchange process of the present invention as recited in Claim 17, in which a solvent having a low boiling point (solvent (b)) is removed by evaporation at a low temperature of 70°C or lower while adding a desired resist solvent (solvent (a)).

The combination of Miyaji and Zampini fails to suggest the claimed process. These references, taken in combination, fail to suggest the solvent exchange specified in Claim 17 of the present application.

In view of the foregoing, the combination of Miyaji and Zampini fails to suggest the claimed process for producing a purified resist polymer solution. Accordingly, the subject matter of the pending claims is not obvious over those references. Withdrawal of this ground of rejection is respectfully requested.

The objections to the claims are believed to be obviated by the amendments submitted above. The issues raised in the Office Action have been addressed by the amendments submitted above.

Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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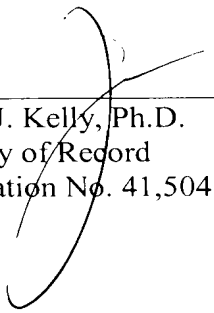

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